

Usefulness of coronary angiography in patients with left atrial myxoma

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ABSTRACT

The purpose of the study was to determine the frequency of coronary artery disease (CAD) in patients >40 years of age with left atrial (LA) myxoma. We analyzed patients diagnosed with LA myxoma who underwent coronary angiography over a 23-year period at Baylor University Medical Center. CAD was found in 14 of the 17 patients (82%), 7 of whom underwent coronary artery bypass grafting at the time of excision of the myxoma. Cardiac catheterization identified vascularity in the LA myxoma in 9 of the 17 patients (53%), with complete angiographic definition of the myxoma in 3. Coronary angiography demonstrated associated CAD and prompted coronary artery bypass grafting in 7 of the 17 patients at the time of excision of the myxoma. Coronary angiography also provided data regarding the vascular supply to the myxoma, which may aid in surgical planning. In conclusion, we believe coronary angiography is warranted in patients >40 years of age with LA myxomas.

KEYWORDS Cardiac myxoma; coronary angiography; coronary artery disease

Although several investigators have described the status of the coronary arteries in patients with cardiac myxomas, most of those reports described few cases.^{1–8} This report describes coronary angiographic findings in 17 patients >40 years of age having operative excision of a left atrial (LA) myxoma at our institution in the past 23 years.

METHODS

The study was approved by the Baylor Scott & White institutional review board. We reviewed the medical records of all 23 patients having operative excision of a LA myxoma at Baylor University Medical Center. Five did not undergo coronary angiography and were excluded. This study included 17 total patients with LA myxoma; 16 had coronary angiography and 1 had computed tomographic coronary angiogram.

Coronary diameter narrowing $\geq 50\%$ was considered evidence of significant coronary artery disease (CAD). Those with CAD were compared to those without CAD. Tumor vascularization was defined as abnormal clusters of small and tortuous vessels arising from a coronary artery and supplying the tumor.^{4,7}

RESULTS

The major findings are summarized in *Table 1*. There were 11 women and 6 men. Their ages ranged from 43 to 84 years (mean 63) at the time of operative excision of the myxoma. The weight of the LA myxomas ranged from 3 to 97 g (mean 25). Extravasated erythrocytes were seen in 9 myxomas; a few had cysts, calcific deposits, and necrotic foci.

All 17 patients had transthoracic echocardiograms, and 16 had transesophageal echocardiograms before and during operation. The echocardiogram provided the initial clinical diagnosis of myxoma in 15 patients; in the other 2 patients, the diagnosis was made by computed tomography of the abdomen.

Sixteen patients underwent cardiac catheterization and one patient had a computed tomographic coronary angiogram. CAD was found in 14 patients (82%); in all 6 men and in 8 of the 11 women. Of these 14 patients, 7 underwent coronary artery bypass grafting at the time of myxoma excision. The left anterior descending artery was significantly narrowed in 7 patients and the right coronary artery in 7. Nonsignificant stenosis was present in the LAD in 6 patients.

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Received April 23, 2020; Revised May 22, 2020; Accepted May 25, 2020.

Table 1. Demographic, clinical, pathologic, and angiographic features of patients with left atrial myxoma and coronary evaluation

Pt	Age (years)	Sex	Myxoma			Symptoms				Narrowed \geq 50% coronary artery									
			Weight (g)	Maximal diameter (cm)	Volume (cm ³)	D	CP	S	O	SH	DM	CS	CAD	LM	LAD	LC	R	R ¹	CABG
1	43	F	97	8	144	+	+	+	0	0	0	0	+	0	+	+	0	0	0
2	49	F	17	4	11	0	+	0	0	0	0	+	+	0	0	0	+	0	0
3	49	M	5	2	3	0	0	0	0	+	0	0	+	0	+	+	+	0	0
4	52	M	5	3	8	0	+	0	0	0	0	0	+	0	+	+	+	0	+
5	54	F	6	4	18	0	+	0	+	0	0	0	0	0	+	0	0	0	0
6	56	F	11	3	10	+	0	0	0	+	+	0	+	0	+	+	0	0	0
7	58	M	26	8	81	+	0	0	0	+	0	+	+	0	+	+	+	+	+
8	59	F	—	4	7	0	+	0	+	0	0	0	+	0	+	0	+	0	+
9	59	F	5	3	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	61	F	3	2	2	0	0	0	0	+	0	0	0	0	0	0	0	0	0
11	68	M	46	—	—	+	+	0	0	0	0	+	+	0	+	+	+	+	+
12	70	F	44	—	—	+	+	0	+	+	+	0	+	0	+	+	+	0	+
13	78	F	32	5	27	0	+	+	0	+	+	0	+	0	+	+	+	+	+
14	78	M	24	4	25	0	0	0	0	+	0	+	+	+	+	0	+	+	+
15	79	F	11	4	16	0	0	+	0	+	0	+	0	0	0	0	0	0	0
16	82	F	—	3	12	+	0	0	0	0	0	0	+	0	+	+	+	0	0
17	84	M	39	5	51	0	0	0	0	+	+	0	0	0	+	0	+	0	0

CABG indicates coronary artery bypass graft; CAD, coronary artery disease; CP, chest pain; CS, cigarette smoker; D, dyspnea; DM, diabetes mellitus; LAD, left anterior descending artery; LC, left circumflex artery; LM, left main artery; O, other symptoms; R, right coronary artery; R¹, ramus intermedius; S, syncope; SH, systemic hypertension; +, present, 0, absent; —, no information.

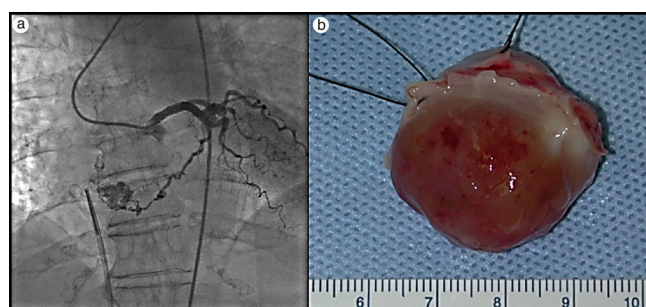


Figure 1. (a) Coronary angiography showing vasculature of a left atrial myxoma with flow provided by the distal left circumflex artery. A Swan-Ganz catheter has been placed in the right atrium for reference. **(b)** Myxoma of the same patient immediately after excision.

Cardiac catheterization identified at least some vascularity of the myxoma in 9 patients (53%). Vascularity was provided by the left circumflex coronary artery in 8 patients; a branch of the right coronary artery supplied flow to the myxoma in case #14 (Table 1). A classic “sea anemone” appearance was seen in the 3 cases with the longest coronary angiography cine runs, an expected finding given the late filling of the tumor (Figure 1).

Vascularity was not seen in 8 patients, probably in part related to short coronary angiography cine runs and to the small size (≤ 6 g) of the myxoma in 5 (32%). There was no correlation between presence of vascularity and weight of the tumor (24 ± 31 vs 22 ± 17 g).

There was no significant difference in the mean ages of patients with CAD (62 years) and without CAD (67 years). There was no relation between symptoms and the presence of CAD. The mean left ventricular end diastolic pressure was 19 ± 6 mm Hg. The mean left ventricular ejection fraction was $56 \pm 13\%$.

The mean myxoma weight was 29 g in patients with CAD and 6 g in patients without CAD ($P = 0.07$). Mean myxoma diameter was 4.3 cm in patients with CAD and 2.6 cm in those without CAD ($P = 0.09$). Mean tumor volume in patients with and without CAD was 33 cm^3 and 8 cm^3 , respectively ($P = 0.18$).

Eight surgeons performed the 17 LA myxoma excision procedures: 1 surgeon performed 4 procedures; 2 surgeons each performed 3 procedures; 2 surgeons each performed 2 procedures; and 3 surgeons each performed 1 procedure. Concomitant coronary artery bypass grafting was performed in 7 patients.

In the 7 patients who had both myxoma excision and coronary bypass, the tumor was resected first in 4 patients and last in the other 3. All myxomas were removed *in toto*, including the part of the atrial septum to which they were attached. None of the 17 patients have had recurrence of the myxoma to date.

DISCUSSION

This study demonstrates that myxomas are commonly associated with CAD that can be significant enough to warrant concomitant coronary artery bypass grafting at the time of tumor excision. Performing cardiac catheterization in patients with suspected myxomas has been debated. Some investigators have postulated that cardiac catheterization has no role in the diagnosis or management of patients with cardiac myxoma and is indicated only in older patients who are at risk for CAD.⁹ Li et al⁴ found CAD in 5 of their 24 patients (21%) with myxoma. Erdil et al¹⁰ found CAD in 4 of their 11 patients with myxoma. Van Cleemput et al² found CAD in 2 of 19 patients with cardiac myxoma; 7 also had angiographically visible tumor vascularity, which emerged from the atrial branches of the right coronary artery in 4 patients and from the left circumflex in 3. Huang et al⁷ found CAD in 4 of their 9 patients with myxoma. Our data showing CAD to be frequent in patients with myxoma argues in favor of performing cardiac catheterization in all patients aged >40 years. CAD was present in 14 of our 17 patients, and coronary artery bypass grafting was performed at the time of the myxoma excision in 7.

Vascularity of the myxomas has been described previously.^{1–8} Tumor vascularity may suggest a propensity to bleed into the tumor.¹¹ Huang et al⁷ described coronary angiographic findings in 9 patients with myxoma, 4 of whom had a “sea anemone” appearance of the tumor vasculature. Fueredi et al¹² reported coronary findings in 5 patients with atrial myxoma, all with vascularity, of whom one had a varix of the myocardium at the base of the tumor. We found at least some myxoma vasculature in 9 of the 17 patients, most having flow provided by the left circumflex artery. A sea anemone appearance was seen in 3 patients, providing clear visualization of the tumor, making possible an unequivocal diagnosis of myxoma by angiography. This finding was observed only with a long cine run, likely due to the relatively slow filling of the tumor.

Coronary embolism in one of our patients with myxoma presented with an inferior wall ST segment elevation myocardial infarction, a problem described by others.¹³

Lastly, computed tomographic coronary angiogram can be considered an alternative to cardiac catheterization in some patients with myxoma.¹⁴

ACKNOWLEDGMENTS

We thank Mr. Jose F. Velasco for his editorial assistance, and Dr. Anela Hundae and Ms. Jong Ko for their contribution to the data collection.

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